

AMENDMENT TO THE CLAIMS

This listing of claims replaces all prior versions in the original application and prior amendment(s).

What is claimed is:

1. (Presently Amended) An apparatus for spin forming a portion of a workpiece, comprising:

a carrier rotatable about a spin axis;

at least a first roller and a second roller operatively supported on said carrier, said first roller being radially and axially offset from said second roller, said first and second rollers radially movable toward and away from the spin axis;

a rotational drive mechanism having an axial drive shaft for spinning said carrier about a spin axis;

a radial drive mechanism for radially translating said first roller and said second roller toward and away from the spin axis to position said rollers for a forming pass, wherein said radial drive mechanism further comprising:

a shaft supported coaxially by said axial drive shaft, radially inboard of said first and second rollers, for guided movement along said spin axis;

an actuator for moving said shaft along said drive shaft coaxial to said spin axis; and

a translation mechanism operable between said shaft and rollers for translating the axial motion of said shaft into radial motion of said rollers; and

an axial drive mechanism for reciprocating one of said first and second rollers or workpiece along a spin axis to sequentially engage said first roller and then said

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second roller to the workpiece where said first roller and said second roller sequentially reduce the diameter of a portion of the workpiece during a forming pass.

2. (Original) The apparatus of claim 1, wherein said axial drive mechanism continues to reciprocate until a desired reduction in diameter is achieved.

3. (Original) The apparatus of claim 1, wherein said radial drive mechanism translates said rollers in unison.

4. (Original) The apparatus of claim 1, wherein said first roller and said second roller sequentially reduce the diameter of a portion of the workpiece to achieve a desired diameter with a minimum number of forming passes.

5. (Original) The apparatus of claim 1, wherein said radial drive mechanism positions said first and second rollers before said axial drive mechanism sequentially engages said first roller and then said second roller to a first end of the workpiece.

6. (Original) The apparatus of claim 5, wherein said radial drive mechanism causes said first roller and said second roller to radially translate inward by an equivalent radial distance prior to a subsequent forming pass.

7. (Original) The apparatus of claim 1, wherein said first roller reduces the diameter of a portion of the workpiece from a first diameter to a second diameter and said second roller reduces the diameter of a portion of the workpiece from a second diameter to a third diameter.

8. (Original) The apparatus of claim 1, wherein said rollers translate inwardly in calculated steps.

9. (Original) The apparatus of claim 7, wherein the change in diameter between the first diameter and second diameter is about equivalent to the change in diameter between the second diameter and third diameter.

10. (Original) The apparatus of claim 5, wherein after a first forming pass, said radial drive mechanism radially translates said first roller from a first radial distance to a third radial distance, relative to the spin axis, where the first radial distance is greater than the third radial distance, and said second roller from a second radial distance to a fourth radial distance, relative to the spin axis, where the second radial distance is greater than the fourth radial distance.

11. (Original) The apparatus of claim 1, wherein said axial drive mechanism reciprocates said rollers toward the workpiece.

12. (Original) The apparatus of claim 11, further comprising a fixture for constraining the workpiece.

13. (Original) The apparatus of claim 1, wherein said radial mechanism is an external actuation device.

14. (Original) The apparatus of claim 1, wherein said radial drive mechanism is an internal actuation device.

15. (Original) The apparatus of claim 1, wherein said radial drive mechanism is operable to translate said first roller and said second roller while said rotational drive mechanism is spinning said carrier.

16. (Original) The apparatus of claim 1, wherein the amount of reduction in a single forming pass is a function of the number of rollers.

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17. (Original) The apparatus of claim 1, wherein the portion of the work piece is reduced from an original diameter to a final diameter on a single apparatus.

18. (Original) The apparatus of claim 1, wherein the number of forming passes to achieve a desired reduction in diameter during a forming operation is a factor of about the number of rollers.

19. (Original) The spin forming apparatus of claim 12, wherein the axis of the non-processed portion of the workpiece is at an oblique angle relative to the spin axis.

20. – 28. (Cancelled)